

**Human calcium metabolism including bone resorption
measured with ^{41}Ca tracer**

Stewart P.H.T. Freeman
Center for Accelerator Mass Spectrometry
Lawrence Livermore National Laboratory
Livermore, CA 94551

The fate of dietary calcium is important. Some passes from the gastrointestinal (G.I.) tract via the extracellular fluid (E.C.F.) to bone and subsequently may be returned to the E.C.F. as bone resorbs. Prolonged negative balance, that is when bone resorption exceeds bone calcium absorption, respectively V_0^- and V_0^+ in Fig. 1, can lead to deficient bone calcium and osteoporosis. While the important long-term bone calcium pool is not directly accessible to experiments with conventional radioactive or stable isotopic tracers, it is to accelerator mass spectrometric detection of ^{41}Ca tracer. There are two such schemes: resorbing calcium can be labeled with ^{41}Ca , the isotope having first been introduced orally or intravenously; alternatively, by continually administering the tracer the more rapidly turning over pools can be saturated with tracer and the tracer-free resorbing bone measured. The latter approach is described here.

Figure 1. Calcium mass flow rates

Unique measurements are possible with very long-lived ^{41}Ca tracer but the exact utility of the two experimental protocols remains to be established. This we are striving to do with several on-going collaborations.

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